Remarks

Claims 1-24 are pending in the present application and are rejected.

Claim 8 is amended to replace "functionality" with "function groups" as suggested by the Examiner.

Claims 12 and 20 are amended to replace "a chromium based catalyst" with "a catalyst comprising chromium", "a vanadium based catalyst" with "a catalyst comprising vanadium", "a cobalt based catalyst" with "a catalyst comprising cobalt", and "a nickel based catalyst" with "a catalyst comprising nickel".

1. Claim Objections

Claim 8 is objected to. Applicants have amended claim 8 to replace "functionality" with "function groups" as suggested by the Examiner.

2. Rejection Under 35 U.S.C. 112, Second Paragraph

Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants respectfully traverse the Examiners rejection under 35. U.S.C. 112, second paragraph for the following reasons. It appears that the Examiner has misunderstood the limitations of independent claims 1, 15, and 23. The Examiner states:

> Throughout these claims, it is not clear how the process is any different than dispersing a support and a catalyst in a liquid in which neither is soluble, then removing the liquid, with the liquid being any solvent, i.e. not necessarily one

> having a boiling point below -100 °C. After all, **temperatures and physical states associated with them are generally relative**.
>
> Office Action dated April 21, 2004 (emphasis added)

The independent claims make it clear that the method of the present invention is different from a process in which a liquid catalyst and a support are dispersed in a liquid in which neither is soluble. In the present invention, the solvent **must freeze** the liquid. By freezing the liquid, the previous liquid catalyst is now in a form suitable for dispersion. The Specification explains:

> The method of this embodiment comprises freezing the liquid catalyst system in a non-reactive liquid to form a frozen catalyst system which is then dispersed within the non-reactive liquid. Such dispersion may be accomplished by suitable mechanical methods such as mechanical stirring. The frozen catalyst system is then contacted with a solid carrier. Finally, the non-reactive liquid is removed to yield the supported catalyst.
>
> Specification, p. 3, ll. 4-9

Each of independent claims 1, 15, and 23 require such freezing thereby clearly distincting a process in which a liquid catalyst and a carrier are merely added to a solvent in which they are insoluble. Accordingly, claims 1-24 are patentable under 35 U.S.C. 112.

The Examiner has stated that claims 12 and 20 are unclear. Claims 12 and 20 are amended to replace: "a chromium based catalyst" with "a catalyst comprising chromium", "a vanadium based catalyst" with "a catalyst comprising vanadium", "a cobalt based catalyst" with "a catalyst comprising cobalt", and "a nickel based catalyst" with "a catalyst comprising nickel".

3. **Rejection Under 35 U.S.C. 103(a)**

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shepodd et al. (U.S. Patent No. 6,110,397).

Applicants respectfully traverse this rejection under 103(a) for the following reasons. Shepodd does not disclose a process of making a supported catalyst from a liquid catalyst in which efficient dispersion is obtained by freezing said liquid catalyst in a solvent, and then contacting the freeze catalyst with a support. Shepodd el al. uses "freeze drying" which is a completely different process. As explained in Shepodd et al:

> In contrast to the prior art, the instant invention embodies a process which involves: 1) dissolving the hydrogen active polymers in a solvent, 2) mixing the solution with a catalyst, 3) adding additives or diluents to modify the solvent/solute phase separations (these additives are intended to modify the end product's final physical/mechanical and/or chemical properties), and 4) introducing the liquid solution suspension as droplets into a cryogenic liquid where these droplets are quickly frozen. . .
>
> Shepodd et al, col. 12, ll. 11-20
>
> The frozen beads of solution are then transferred to a vacuum chamber where the solvent is removed below the freezing point of the suspension by freeze-drying. Care is taken to avoid allowing the beads to warm and thaw.
>
> Shepodd et al, col. 12, ll. 11-20

It is clear that in Shepodd it is a reaction mixture that is frozen. Moreover, Shepodd does not disclose a process for making a supported catalyst as required by the present invention. Instead, Shepodd merely **uses** a supported catalyst:

> The present invention then, is directed to the use of organic polymers containing carbon--carbon double bonds throughout their structures, preferably polybutadiene, polyisoprene, and

> functionalized derivatives thereof, intimately mixed with an insoluble noble metal catalyst composition, preferably Pd supported on carbon.
>
> Shepood et al, col. 4, ll. 13-19.

Accordingly, claims 1-24 are patentable under 35 U.S.C. 103(a) over Shepodd et al. (U.S. Patent No. 6,110,397).

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Bend et al. (U.S. Patent No. 3,857,795).

Applicants respectfully traverse this rejection under 103(a) for the following reasons. Van Der Bend et al. does not disclose a method in which a supported catalyst is made. Specifically, Van Der Bend et al. does not disclose a process of making a supported catalyst from a liquid catalyst in which efficient dispersion is obtained by freezing said liquid catalyst in a solvent and then contacting the freeze catalyst with a support. Instead Van Der Bend et al. discloses a method in which two chemical components are reacted together at a low temperature. Specifically, $TiCl_4$ is reacted with an alkyl aluminum compound. Neither of these compounds is a liquid catalyst and neither is a solid carrier as required by independent claims 1, 15, and 23. In the Example at col. 8, l. 65 - col. 9, l.39, a TiCl4 solution is reacted with a triethyl aluminum solution. It is significant that neither $TiCl_4$ nor triethyl aluminum is a solid carrier. It is irrelevant if the product of the Van Der Bend el al. disclosure is a supported catalyst since this reference does not use a solid carrier or a liquid catalyst as the input reagents. Applicants disagree that the product of Van Der Bend is a supported catalyst but do not rely on this argument at this time.

Accordingly, claims 1-24 are patentable under 35 U.S.C. 103(a) over Van Der Bend et al., U.S. Patent No. 3,857,795 .

Conclusion

Applicants have made a genuine effort to respond to each of the Examiner's rejections in advancing the prosecution of this case. Applicants believe that all formal and substantive requirements for patentability have been met and that this case is in condition for allowance, which action is respectfully requested. If a telephone or video conference would help expedite allowance or resolve any additional questions, such a conference is invited at the Examiner's convenience.

The Commissioner is authorized to charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

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